

**WHAT IS CLAIMED IS:**

1. An isolated cationic cathelin-like peptide having antimicrobial activity and comprising an amino acid sequence:

5 (Q/R)X<sub>1</sub>(L/P)SY(K/R)(E/D)AVLRA(V/I)X<sub>2</sub>X<sub>3</sub>X<sub>4</sub>N(E/Q)(Q/R)S(S/L)(D/E)  
 )X<sub>5</sub>NLYRLLX<sub>6</sub>L(D/N)X<sub>7</sub>X<sub>8</sub>PX<sub>9</sub>X<sub>10</sub>(D/E)X<sub>11</sub>DPX<sub>12</sub>(T/I)(P/R)K(P/S)V(S/R)F  
 (T/R)VKETVC(P/G)(K/R)X<sub>13</sub>(T/E)(Q/R)QX<sub>14</sub>(P/L)EX<sub>15</sub>CX<sub>16</sub>FKX<sub>17</sub>X<sub>18</sub>G(L/  
 R)VK(Q/R)CX<sub>19</sub>G(A/T)V(T/I)L(D/N)X<sub>20</sub>X<sub>21</sub>X<sub>22</sub>X<sub>23</sub>X<sub>24</sub>(F/L)D(I/L)(N/S)C  
 (N/D)X<sub>25</sub>X<sub>26</sub>X<sub>27</sub>X<sub>28</sub>X<sub>29</sub>X<sub>30</sub>X<sub>31</sub>(SEQ ID NO:3), wherein X<sub>1</sub> is A, V or  
 10 T; X<sub>2</sub> is N, D or G; X<sub>3</sub> is G, R, D or Q; X<sub>4</sub> is L, I or F; X<sub>5</sub>  
 is E, A or T; X<sub>6</sub> is Q, E or D; X<sub>7</sub> is S, Q or P; X<sub>8</sub> is Q, P,  
 R, E or A; X<sub>9</sub> is K, T, Q or N; X<sub>10</sub> is G, A, M or D; X<sub>11</sub> is  
 G, E or V; X<sub>12</sub> is N, G or D; X<sub>13</sub> is P, T or A; X<sub>14</sub> is P, S  
 or L; X<sub>15</sub> is Q, L, D or E; X<sub>16</sub> is G, D or A; X<sub>17</sub> is D, E or  
 15 K; X<sub>18</sub> is N, D or Q; X<sub>19</sub> is E, V or M; X<sub>20</sub> is E, P or Q;  
 X<sub>21</sub> is D, S or A; X<sub>22</sub> is T, I, R, A or N; X<sub>23</sub> is G, H or D;  
 X<sub>24</sub> is S, Y or Q; X<sub>25</sub> is S, E or K; X<sub>26</sub> is I, D, A or L;  
 X<sub>27</sub> is L, Q or N; X<sub>28</sub> is S, P, K or Q; X<sub>29</sub> is V, F or R;  
 X<sub>30</sub> is R, F or K; and X<sub>31</sub> is F, A, R or K

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2. An isolated polynucleotide that encodes a peptide of claim 1.

3. A method for inhibiting the growth of a bacterium or  
 25 yeast comprising contacting the bacterium or yeast with an  
 inhibiting effective amount of a peptide comprising an  
 amino acid sequence selected from the group consisting of:

(a)

(Q/R)X<sub>1</sub>(L/P)SY(K/R)(E/D)AVLRA(V/I)X<sub>2</sub>X<sub>3</sub>X<sub>4</sub>N(E/Q)(Q/R)S(S/L)  
 30 ) (D/E)X<sub>5</sub>NL  
 YRLLX<sub>6</sub>L(D/N)X<sub>7</sub>X<sub>8</sub>PX<sub>9</sub>X<sub>10</sub>(D/E)X<sub>11</sub>DPX<sub>12</sub>(T/I)(P/R)K(P/S)V(S/R)F(T/R)

VKETVC (P/G) (K/R) X<sub>13</sub> (T/E) (Q/R) QX<sub>14</sub> (P/L) EX<sub>15</sub> CX<sub>16</sub> FKX<sub>17</sub> X<sub>18</sub> G (L/R) VK (Q/R) CX<sub>19</sub> G (A/T) V (T/I) L (D/N) X<sub>20</sub> X<sub>21</sub> X<sub>22</sub> X<sub>23</sub> X<sub>24</sub> (F/L) D (I/L) (N/S) C (N/D) X<sub>25</sub> X<sub>26</sub> X<sub>27</sub> X<sub>28</sub> X<sub>29</sub> X<sub>30</sub> X<sub>31</sub> (SEQ ID NO:3),

wherein X<sub>1</sub> is A, V or T; X<sub>2</sub> is N, D or G; X<sub>3</sub> is G, R, D or Q; X<sub>4</sub> is L, I or F; X<sub>5</sub> is E, A or T; X<sub>6</sub> is Q, E or D; X<sub>7</sub> is S, Q or P; X<sub>8</sub> is Q, P, R, E or A; X<sub>9</sub> is K, T, Q or N; X<sub>10</sub> is G, A, M or D; X<sub>11</sub> is G, E or V; X<sub>12</sub> is N, G or D; X<sub>13</sub> is P, T or A; X<sub>14</sub> is P, S or L; X<sub>15</sub> is Q, L, D or E; X<sub>16</sub> is G, D or A; X<sub>17</sub> is D, E or K; X<sub>18</sub> is N, D or Q; X<sub>19</sub> is E, V or M; X<sub>20</sub> is E, P or Q; X<sub>21</sub> is D, S or A; X<sub>22</sub> is T, I, R, A or N; X<sub>23</sub> is G, H or D; X<sub>24</sub> is S, Y or Q; X<sub>25</sub> is S, E or K; X<sub>26</sub> is I, D, A or L; X<sub>27</sub> is L, Q or N; X<sub>28</sub> is S, P, K or Q; X<sub>29</sub> is V, F or R; X<sub>30</sub> is R, F or K; and X<sub>31</sub> is F, A, R or K; and

(b) SEQ ID NO:2 from about amino acid 31 to 131.

4. The method of claim 3, wherein the bacterium is gram positive.

5. The method of claim 3, wherein the bacterium is gram negative.

6. The method of claim 3, further comprising contacting the bacterium or yeast with at least one antimicrobial agent.

7. The method of claim 6, wherein the antimicrobial agent is selected from the group consisting of a  $\beta$ -lactam, novobiocin, polymyxin B, and LL-37.

8. The method of claim 3, wherein the contacting is in vitro.

9. The method of claim 3, wherein the contacting is in vivo.

10. The method of claim 9, wherein the contacting is by topical administration.

11. A peptide having from about 96 to about 100 amino acids and including a sequence shown in SEQ ID NO:3, wherein X1 is A, V or T; X2 is N, D or G; X3 is G, R, D or Q; X4 is L, I or F; X5 is E, A or T; X6 is Q, E or D; X7 is S, Q or P; X8 is Q, P, R, E or A; X9 is K, T, Q or N; X10 is G, A, M or D; X11 is G, E or V; X12 is N, G or D; X13 is P, T or A; X14 is P, S or L; X15 is Q, L, D or E; X16 is G, D or A; X17 is D, E or K; X18 is N, D or Q; X19 is E, V or M; X20 is E, P or Q; X21 is D, S or A; X22 is T, I, R, A or N; X23 is G, H or D; X24 is S, Y or Q; X25 is S, E or K; X26 is I, D, A or L; X27 is L, Q or N; X28 is S, P, K or Q; X29 is V, F or R; X30 is R, F or K; and X31 is F, A, R or K

12. A pharmaceutical composition for therapy of bacterial infections and/or disorders comprising a peptide selected from the group consisting of:

(a) a peptide comprising a sequence

(Q/R)X<sub>1</sub>(L/P)SY(K/R)(E/D)AVLRA(V/I)

X<sub>2</sub>X<sub>3</sub>X<sub>4</sub>N(E/Q)(Q/R)S(S/L)(D/E)X<sub>5</sub>NLYRLLX<sub>6</sub>L(D/N)X<sub>7</sub>X<sub>8</sub>PX<sub>9</sub>X<sub>10</sub>(D/E)X<sub>11</sub>D  
PX<sub>12</sub>(T/I)(P/R)K(P/S)V(S/R)F(T/R)VKETVC(P/G)(K/R)X<sub>13</sub>(T/E)(Q/R)  
QX<sub>14</sub>(P/L)EX<sub>15</sub>CX<sub>16</sub>FKX<sub>17</sub>X<sub>18</sub>G(L/R)VK(Q/R)CX<sub>19</sub>G(A/T)V(T/I)L(D/N)X<sub>20</sub>X

$_{21}X_{22}X_{23}X_{24}(F/L)D(I/L)(N/S)C(N/D)X_{25}X_{26}X_{27}X_{28}X_{29}X_{30}X_{31}$  (SEQ ID NO:3),

wherein X1 is A, V or T; X2 is N, D or G; X3 is G, R, D or Q; X4 is L, I or F; X5 is E, A or T; X6 is Q, E or D; X7 is S, Q or P; X8 is Q, P, R, E or A; X9 is K, T, Q or N; X10 is G, A, M or D; X11 is G, E or V; X12 is N, G or D; X13 is P, T or A; X14 is P, S or L; X15 is Q, L, D or E; X16 is G, D or A; X17 is D, E or K; X18 is N, D or Q; X19 is E, V or M; X20 is E, P or Q; X21 is D, S or A; X22 is T, I, R, A or N; X23 is G, H or D; X24 is S, Y or Q; X25 is S, E or K; X26 is I, D, A or L; X27 is L, Q or N; X28 is S, P, K or Q; X29 is V, F or R; X30 is R, F or K; and X31 is F, A, R or K; and

(b) a peptide comprising a sequence as set forth in SEQ ID NO:2 from about amino acid 31 to 131, in a pharmaceutically acceptable carrier.

13. The composition of claim 12 in a controlled release formulation.

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14. The composition of claim 12 in a liposomal form.

15. The composition of claim 12 in a lyophilized form.

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16. The composition of claim 12 in a unit dosage form.

17. The composition of claim 12 in an aerosol form.

18. The composition of claim 12 in a foam.

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19. A method of alleviating symptoms of a bacterial infection in a subject, comprising administering an effective amount of an N-terminal active fragment of a cathelicidin-derived peptide comprising a sequence as set forth in SEQ ID NO:2; or a peptide comprising a sequence as set forth in SEQ ID NO:3, wherein X1 is A, V or T; X2 is N, D or G; X3 is G, R, D or Q; X4 is L, I or F; X5 is E, A or T; X6 is Q, E or D; X7 is S, Q or P; X8 is Q, P, R, E or A; X9 is K, T, Q or N; X10 is G, A, M or D; X11 is G, E or V; X12 is N, G or D; X13 is P, T or A; X14 is P, S or L; X15 is Q, L, D or E; X16 is G, D or A; X17 is D, E or K; X18 is N, D or Q; X19 is E, V or M; X20 is E, P or Q; X21 is D, S or A; X22 is T, I, R, A or N; X23 is G, H or D; X24 is S, Y or Q; X25 is S, E or K; X26 is I, D, A or L; X27 is L, Q or N; X28 is S, P, K or Q; X29 is V, F or R; X30 is R, F or K; and X31 is F, A, R or K, to the subject.

20. The method of claim 19, wherein said administering is selected from the group consisting of: intravenous, intramuscular, intradermal, subcutaneous, intracranial, intracerebrospinal, topical, oral, transdermal, transmucosal and transnasal.

21. A method of promoting tissue repair and regeneration in a subject comprising contacting an injured tissue with a composition comprising a peptide selected from the group consisting of:

(a) a peptide comprising a sequence  
 (Q/R)X<sub>1</sub>(L/P)SY(K/R)(E/D)AVLRA(V/I)X<sub>2</sub>X<sub>3</sub>X<sub>4</sub>N(E/Q)(Q/R)S(S/L)  
 (D/E)X<sub>5</sub>NLYRLLX<sub>6</sub>L(D/N)X<sub>7</sub>X<sub>8</sub>PX<sub>9</sub>X<sub>10</sub>(D/E)X<sub>11</sub>DPX<sub>12</sub>(T/I)(P/R)K(P/S)V  
 (S/R)F(T/R)VKETVC(P/G)(K/R)X<sub>13</sub>(T/E)(Q/R)QX<sub>14</sub>(P/L)EX<sub>15</sub>CX<sub>16</sub>FKX<sub>17</sub>

X<sub>18</sub>G(L/R)VK(Q/R)CX<sub>19</sub>G(A/T)V(T/I)L(D/N)X<sub>20</sub>X<sub>21</sub>X<sub>22</sub>X<sub>23</sub>X<sub>24</sub>(F/L)D(I/L)  
(N/S)C(N/D)X<sub>25</sub>X<sub>26</sub>X<sub>27</sub>X<sub>28</sub>X<sub>29</sub>X<sub>30</sub>X<sub>31</sub> (SEQ ID NO:3),

wherein X<sub>1</sub> is A, V or T; X<sub>2</sub> is N, D or G; X<sub>3</sub> is G, R,  
D or Q; X<sub>4</sub> is L, I or F; X<sub>5</sub> is E, A or T; X<sub>6</sub> is Q, E or D;  
5 X<sub>7</sub> is S, Q or P; X<sub>8</sub> is Q, P, R, E or A; X<sub>9</sub> is K, T, Q or N;  
X<sub>10</sub> is G, A, M or D; X<sub>11</sub> is G, E or V; X<sub>12</sub> is N, G or D;  
X<sub>13</sub> is P, T or A; X<sub>14</sub> is P, S or L; X<sub>15</sub> is Q, L, D or E;  
X<sub>16</sub> is G, D or A; X<sub>17</sub> is D, E or K; X<sub>18</sub> is N, D or Q; X<sub>19</sub>  
is E, V or M; X<sub>20</sub> is E, P or Q; X<sub>21</sub> is D, S or A; X<sub>22</sub> is T,  
10 I, R, A or N; X<sub>23</sub> is G, H or D; X<sub>24</sub> is S, Y or Q; X<sub>25</sub> is S,  
E or K; X<sub>26</sub> is I, D, A or L; X<sub>27</sub> is L, Q or N; X<sub>28</sub> is S, P,  
K or Q; X<sub>29</sub> is V, F or R; X<sub>30</sub> is R, F or K; and X<sub>31</sub> is F,  
A, R or K; and

(b) a peptide comprising a sequence as set forth in SEQ ID  
15 NO:2 from about amino acid 31 to 131.